**IN THE DRAWINGS:**

Please replace the existing Figure 1 in the present application, with the attached new Figure 1 (attached hereto as Appendix A). Appendix B includes a marked up copy of the figures showing the changes made.

## REMARKS

These remarks are in response to the Final Office Action mailed May 22, 2002. Claims 111 and 125 have been canceled without prejudice to Applicants' right to prosecute the canceled subject matter in any divisional, continuation, continuation-in-part or other application. Support for the amendments to the claims can be found throughout the specification and claims as originally filed. For example, the amendments to 98 are supported at page 25, lines 16-23; the Examples and Figures. Support for the amendments to claim 105 are supported, for example, at page 53, line 13-15. The amendments to claims 108, 128, and 152 are supported, for example, at page 34, lines 9-14. Support for the amendments to claims 115, 128, 134, and 137 can be found, for example, at page 1, lines 16-18; and page 13, lines 10-13. Additional amendments to the claims are to correct typographical or grammatical errors, or to correct/maintain antecedent basis for certain claim terms. No new matter is believed to have been added. Attached is a marked-up version of the changes being made by the current amendment.

Applicants thank the Examiner for the courteous interview with Applicants' representatives Dr. Nathan Lewis and Joseph Baker on September 11, 2002.

## I. INFORMATION DISCLOSURE STATEMENTS

Applicants respectfully request the Examiner to indicate consideration of the references cited in the Information Disclosure Statements of October 23, 2000, and February 20, 2002, by initialing the Form PTO-1449 and returning an initialed copy to Applicants' representative.

## II. OBJECTION TO THE DRAWINGS

The drawings are objected to under 37 C.F.R. §1.83(a), as allegedly failing to show every feature of the invention specified in the claims. Applicants' respectfully traverse this objection.

Applicants discussed the drawings with the Examiner in the interview of September 11, 2002. During the interview the Examiner indicated that the amendments to Figure 1C addressed the objection as applied to the figures and claims 154-158. For example, Figure 1C has been amended to reflect the "flow passage". Support for the change to Figure 1C can be found in the legend for Figure 1C (page 14, line 22 to page 15, line 1), which references the "system" as found in claim 152 (and supported in claim 77 as originally filed); the "flow passage" is found in claims 154-156 and is supported in claims 79-81 as originally filed as well as at pages 12-13 of the specification.

Figure 1A stands rejected as allegedly introducing new matter. The Office Action alleges that the original disclosure does not support the showing of the specific compositions of the sensors to Figure 1A. Applicants respectfully traverse.

Support for the specific compositions recited in Figure 1A can be found throughout the specification as originally filed. For example, support can be found at page 17, line 22 to page 18, line 5; page 18, lines 6-9; page 26, lines 12-22, page 49, lines 10-21, page 85, lines 14-24; page 86, lines 15-17; and claims 4 and 10 as originally filed.

However, in order to advance prosecution, Applicants have amended Figure 1A in accordance with the Examiner's suggestion to identify elements 1-16 with respect to a Markush of possible materials for each element. Applicants submit that this amendment does not add new matter and is supported throughout the specification and claims as filed.

Attached hereto are replacement Figure 1A and 1C as well as marked up copies showing the changes made to the figures using standard notation (e.g., underlining in red-ink). Applicants do not believe that any of the changes to the figures introduce new matter. Should the Examiner believe that new matter is introduced Applicants respectfully request the Examiner to call the undersigned representative so that additional citations to the specification, claims, and figures may be provided to the Examiner.

Accordingly, Applicants respectfully request withdrawal of the objections to the drawings.

## III. REJECTION UNDER 35 U.S.C. §112, SECOND PARAGRAPH

Claims 98-147 stand rejected under 35 U.S.C. §112, second paragraph, as allegedly indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, it is alleged that it is unclear whether two different materials that

exhibit the same response are excluded as sensing materials or if the statement is actually non-limiting and unnecessary because no two responses can be identical. In addition, it is alleged that the term "highly doped" is a relative phrase that renders the claims indefinite. Applicants respectfully traverse this rejection.

Applicants have amended claims 98, 104-106, 108, 115, 126, 128, 134, and 137 to clarify the response as it relates to the analyte. Applicants respectfully submit that a response includes the lack of a signal. Thus, a response includes a change in resistance, impedance etc., or lack thereof, which may vary depending upon the absorption or adsorption of an analyte to a sensor or senor array.

Applicants respectfully submit that one of skill in the art would be capable of assessing the term "highly" as it relates to the doping of the particular material. However, in order to advance prosecution and/or to present the claims in better form for appeal, Applicants have amended claims 98, 104-105 and 107 to remove the term "highly".

Based upon the foregoing remarks Applicants respectfully request withdrawal of the §112, second paragraph rejections.

## IV. REJECTION UNDER 35 U.S.C. §102

Claims 98-99 and 104-105 stand rejected under 35 U.S.C. §102(b) as allegedly anticipated by Bruschi, Guiseppi-Elie, Matsumura, or Thackeray. Applicants' respectfully traverse this rejection.

None of the cited references teach or suggest each and every element of Applicants claimed invention. For example, none of the cited references teach or suggest "alternating

regions" or "interpenetrating regions" as recited in claims 98 and 104 respectively. Claim 98 reads in part:

> . . . a sensing area comprising *alternating regions* of a conductive organic material and a conductive material compositionally different than the conductive organic material disposed between, and in electrical communication with, the at least two conductive leads, wherein the sensing area provides an *electrical path through the regions* of the conductive organic material and the regions of the compositionally different conductive material, and wherein the sensing area is in direct contact with a vapor comprising an analyte to be detected,. . . . (Claim 98; emphasis added).

Claim 104 reads in part:

> . . . a sensing area comprising *alternating interpenetrating regions* of a conductive organic material and a conductive material compositionally different than the conductive organic material disposed between and in electrical communication with the at least two conductive leads, wherein *the sensing area provides an electrical path through the regions* of the conductive organic material and the regions of the compositionally different conductive material, and wherein the sensing area is in direct contact with a vapor comprising an analyte to be detected,. . . . (Claims 104; emphasis added).

Bruschi teaches layering polypyrrole onto a photoresist matrix of non-conductive copper chloride by polymerizing saturated pyrrole vapor onto the photoresist matrix (see, e.g., page 70 of Bruschi). By this method a film or layer is produced over the copper chloride thereby producing at least two film layers, a first layer of a copper chloride photoresist matrix and a second layer of polypyrrole on top of the photoresist matrix. This does not generate interpenetrating regions as recited in Applicants' claims. In addition, the materials

taught and suggested by Bruschi are conductive and non-conductive.

Bruschi does not teach or suggest each and every element of Applicants' claimed invention (e.g., "alternating regions", "alternating interpenetrating regions", "inorganic conductor[s]", and two conductive materials) and thus cannot anticipate Applicants' claimed invention.

Guiseppi-Elie also teaches a layer composition. In Guiseppi-Elie an aniline film was deposited to "yield a green fully adherent, *contiguous* film." (Guiseppi-Elie, column 10, lines 53-58; emphasis added). The *contiguous* layer is then derivatized to attach on the surface an "indicator reagent". (Guiseppi-Elie, column 10, lines 66-68).

Guiseppi-Elie, much like Bruschi does not teach or suggest each and every element of Applicants' claimed invention (e.g., "alternating regions", "alternating interpenetrating regions", "inorganic conductor[s]", and two conductive materials). Accordingly, Guiseppi-Elie cannot anticipate Applicants' claimed invention.

Matsumara et al. teaches the growth of polyacetylene in the presence of a dopant. Polyaetylene is naturally a salt and thus carries an anion. In order to grow polyacetylene Matsumara et al. uses a dopant. Matsumara et al. teaches at Example 1, column 4, lines 23-39, that polyacetylene grown in a palladium (Pd) dopant contained only divalent Pd and that the Pd did not participate in the increase in electrical conductivity. Because Pd dopants and Pt dopants play a similar role in growing polyacetylene, Pt dopants also would not participate in the electrical conductivity. Thus, the Pt dopants and other dopants described in Matsumara do not give rise to regions of conductive

organic material and the dissimilar, compositionally different conductive material found in Applicants' sensors. Accordingly, Matsumara et al. cannot anticipate Applicants' claimed invention.

Thackeray et al. teach a polymer layer having disposed on the surface Pt catalyst. The polymer layer covers the electrodes such that the Pt catalyst layers are not between the electrodes but rather on the surface of the polymer layer (see, e.g., Scheme I and II pages 6674-6675 of Thackeray et al.). In addition, the chemistry which produces a signal in Thackeray et al. is electrochemical in nature, requiring an aqueous media containing ions to maintain a potential on the sensor. The electrochemical reaction involves a transfer of faradic charge and associated ions between the sensor of Thackeray et al. and the phase containing the analyte to be sensed. Thus, a vapor is not in direct contact with the sensor of Thackeray et al.

Applicants' claimed invention does not require such a charger transfer system and thus can sense analytes that the electrochemical approach cannot, and can do so in contact with liquids or other ambients like gases that do not support electrochemical reactions. For example, claims 98 and 104 recite that a vapor is in direct contact with the sensing area. This is in contrast to the sensor of Thackeray et al., which does not make direct contact with the medium comprising the analyte.

For at least the foregoing reasons Thackeray et al. cannot anticipate Applicants' claimed invention.

Accordingly, Applicants respectfully request withdrawal of the §102(b) rejection of claims 98-99 and 104-105 over Bruschi,

Guiseppi-Elie, Matsumura, and Thackeray et al. for at least the foregoing reasons.

Claims 98-99, 104-109, 111-112, 119-120, 123-129, 134, 141-142, and 145-157 stand rejected under 35 U.S.C. §102(b) as allegedly anticipated by Gibson. Claims 111 and 125 have been canceled without prejudice, thus the rejection is moot with respect to these claims. Applicants respectfully traverse this rejection.

During the telephonic interview with the Examiner on September 11, 2002, Applicants discussed Gibson. In that discussion, the Examiner indicated that Applicants' invention was different from Gibson. However, the Examiner indicated that "regions" as recited in Applicants' claims did not reflect that Applicants' materials were non-homogenous and thereby distinct regions. Applicants submit that the term "alternating regions" inherently means that there are defined boundaries between the two compositionally different materials in Applicants' sensors thereby forming "regions".

Applicants respectfully submit that Gibson does not teach or suggest a sensing area comprising regions of conductive organic material and a compositionally different conductive material between the conductive leads as set forth by Applicants' claimed invention. In addition, Gibson does not teach or suggest "interpenetrating regions" of the materials as recited in Applicants' independent claims 104-106, 108, 126-128, and 152. Gibson also does not teach or suggest "inorganic conductor[s]" or "carbon black" as recited in Applicants' claim 98. The Examiner also recognizes the deficiency of Gibson (see, page 6 paragraph 8 of the Office Action), wherein the Examiner

states, "Gibson does not teach the extent of the compositions in which the two conductive materials are mixed together to form a single sensing material. . ."

The Examiner is respectfully directed to the Abstract of Gibson which teaches, ". . .a sensor having a substrate and one or more *layers* of a conductive polymer overlaying the electrodes. . ." The "layers" of polymers described in Gibson are cumulative to the teachings of Burschi, Guiseppi-Elie, and Thackery et al. Gibson does not teach or suggest "interpenetrating regions" as described above. In addition, Gibson does not teach or suggest the material compositions as recited in Applicants' claim 98.

Accordingly, Gibson does not teach or suggest each and every element of Applicants' claimed invention and thus the §102(b) rejection may be properly withdrawn.

## V. REJECTIONS UNDER 35 U.S.C. §103(a)

Claims 98-158 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Gibson as applied to claims 98-99, 104-109, 111-112, 119-120, 123-129, 134, 141-142, and 145-157 above, and further in view of Casella, de Lacy Costello, Rajeshwar, Yamato, Bruschi, Guiseppi-Elie, Matsumura, or Thackeray (as above), and Breheret, Mifsud (I and II), Moy, or Persaud.

Gibson is characterized as above (i.e., as failing to teach compositions in which the two materials are mixed together to form a single sensing material having "regions" and "interpenetrating regions").

Casella is combined with Gibson to overcome the deficiencies of Gibson. However, Casella does not remedy the

deficiencies of Gibson and thus does not render the present invention obvious. For example, Casella teaches that the copper particles are "deposited onto" the polyaniline films of Casella (see page 219, first column, 6 lines from the bottom; page 220, second column, lines 1-3; page 221, column 1, lines 1-4). Thus, the combination of Gibson and Casella teach and suggest a layering of materials. Accordingly, Casella has the same deficiency as Gibson in that Casella also fails to teach or suggest compositions in which the two materials are mixed together to form a single sensing material. The combination of Gibson and Casella fails to teach or suggest each and every element of Applicants' claimed invention.

Gibson is also combined with de Lacy Costello. This combination of references also fails to teach each and every element of Applicants' claimed invention. First Applicants respectfully submit that there is no teaching or suggestion to combine the references, however, even if there was a suggestion to combine the two references the combination still does not teach or suggest each and every element of Applicants' claimed invention. For example, de Lacy Costello teaches an inorganic semiconductive material composite (i.e., a material that has an electrical conductivity that increases as the temperature increases). Applicants' claimed invention (see, e.g., claim 98) recites an inorganic conductive material wherein the conductivity of the material decreases as the temperature increases. Accordingly, a combination of Gibson and de Lacy Costello fails to teach or suggest Applicants' claimed invention.

In order to further overcome the deficiencies of Gibson, the Office Action combines Gibson in view of Rajeshwar.

Rajeshwar teaches sensors having on their surface compounds that accept released anions and thereby changes their light emissions (see, Rajeshwar at page 235, first column, second full paragraph). Applicants submit that even if there were motivation to combine Gibson and Rajeshwar, which there is not, at most the combination would teach the use of fluorophoric compounds and a polymer material. Accordingly the combination of Gibson and Rajeshwar fail to teach or suggest each and every element of Applicants' claimed invention.

The Office Action further attempts to overcome the deficiencies of Gibson, by combining Gibson in view of Yamato. Yamato teaches sensors having on their surface glucose oxidase (GOD) (see, Yamato at page 235, first column, section 3.2). Applicants submit that even if there were motivation to combine Gibson and Yamato, which there is not, at most the combination would teach the use of immobilized enzymes on a polymer material. Accordingly the combination of Gibson and Yamato fail to teach or suggest each and every element of Applicants' claimed invention.

The Office Action alleges that Applicants' invention is obvious over Gibson in view of Breheret. Gibson is discussed above. Breheret mentions two different types of sensors: 1) semiconductor gas sensors, and 2) conducting polymer sensors. Neither sensor is described nor does Breheret teach or suggest the composition of the sensors. The only description found in the Breheret reference is to the "AROMASCAN A20S Device". Applicants respectfully submit that the Breheret reference is not enabled for any teaching relied upon by the Examiner to render Applicants' invention obvious. However, even if the Breheret reference was enabled, Breheret teaches away from

Applicants' claimed invention due to the teaching that such polymer films are less sensitive than semiconductive gas sensors. This is in contrast to the unexpected finding presented in Applicants' disclosures which teaches that the conductive organic polymers and compositionally different conductive material composites have orders of magnitude better sensitivity than other conventional polymer composites to amine analytes. Accordingly, the combination of Gibson and Breheret fails to teach or suggest each and every element of Applicants' claimed invention.

Applicants' claimed invention is further rejected as allegedly obvious over Gibson in view of either/both Mifsud references. Applicants respectfully submit that Mifsud fails for the same reasoning as presented for Breheret above. The Mifsud reference does not enable the polymer sensors (i.e., there is no teaching or suggestion as to the composition of such polymer sensors). The only teaching that would allow a person skilled in the art to have the faintest idea as to the composition of the conductive polymer sensors is found at column 1, lines 53-64, which teaches that the conductive polymer sensors "have a film made of a conductive polymer sensitive to the molecules of odorous substances." Mifsud fails to teach or suggest a sensing area of a conductive organic polymer and a compositionally different conductive material.

Applicants' claimed invention is further rejected as allegedly obvious over Gibson in view of Moy. Applicants respectfully submit that Moy fails for the same reasoning as presented for Breheret and Mifsud above. The Moy reference does not enable the polymer sensors (i.e., there is no teaching or suggestion as to the composition of such polymer sensors). Moy

teaches as most an array of (1) metal oxide gas sensors and (2) sensors having a conductive polymer. Moy does not teach or suggest a sensor comprising a material having both a conductive organic material and a compositionally different conductive material. Nor does Moy teach or suggest an array of sensor, wherein at least one sensor comprises a material having both a conductive organic material and a compositionally different conductive material. Thus, the combination of Gibson and Moy does not teach or suggest Applicants' claimed invention.

Applicants' claimed invention is further rejected as allegedly obvious over Gibson in view of Persaud. Applicants respectfully submit that Persaud fails for the same reasoning as presented for Breheret, Mifsud, and Moy, above. Persaud teaches as most a sensor having an organic polymeric semiconductor such as polyindole (see, e.g., page 4, line 2). Persaud does not teach or suggest a sensor having a sensing area comprised of a combination of a conductive organic material and a compositionally different conductive material. Nor does Persaud teach or suggest an array of sensor, wherein at least one sensor comprises a material having both a conductive organic material and a compositionally different conductive material. Thus, the combination of Gibson and Moy does not teach or suggest Applicants' claimed invention.

To briefly summarize the foregoing remarks. The Examiner is respectfully reminded that a prima facie case of obviousness requires at a minimum the following: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference

teachings; (2) there must be a reasonable expectation of success; and (3) the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP §2143.

Gibson does not teach or suggest, for example, carbon-black and/or inorganic conductors combined with a compositionally different conductive material; interpenetrating materials; and/or microorganism detection. The combination of the additional references with Gibson does not overcome these deficiencies. In fact, Breheret and Moy actually teach away from Applicants' claimed invention by stating that semi-conductor gas sensors are better at detection than polymer based sensors. Because the Breheret and Moy references actually teach away, one of skill in the art would not be motivated to combine the teachings as suggested in the Office Action.

Applicants respectfully submit that there is no motivation to combine the cited references, however, even if there was some motivation the combinations fail to teach or suggest each and every element of Applicants' claimed invention.

Finally, the Applicants respectfully remind the Examiner that it is impermissible to ignore the advantages, properties, utilities and unexpected results that flow from the claimed invention; they are part of the invention as a whole. *In re Wright*, 848 F.2d 1216, 6 USPQ2d 1959 (Fed. Cir. 1988); *In re Sernaker*, 702 F.2d 989, 217 USPQ 1 (Fed. Cir. 1983). Unexpected properties must always be considered when determining obviousness. The Applicants respectfully directed the Examiner to the prior response which elucidated the unexpected results

and properties of Applicants' invention. As stated in *Application of Orfeo*, 440 F.2d 439, 442 (CCPA 1971),:

> We think that this is one of those cases where even though the claimed invention involves the use of a known compound in a known process it is still unobvious to one of ordinary skill in the art because of the new and unexpected results and effects achieved.

Accordingly, Applicants respectfully request withdrawal of the §103(a) rejection based upon any of the foregoing combinations.

Applicant asks that all claims be allowed. Enclosed is a $110.00 check for the Petition for Extension of Time fee. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: 9/23/02

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## Version with markings to show changes made

**In the claims:**

Claims 111 and 125 have been cancelled, without prejudice.

Claims 98, 104-107, 108, 115, 117, 124, 126, 128, 134, 137, 142-143, and 152 have been amended as follows:

98. (Amended) A sensor, comprising:

at least two conductive leads;

a sensing area comprising alternating regions of a conductive organic material and a conductive material compositionally different than the conductive organic material disposed between, and in electrical communication with, the at least two conductive leads, wherein the sensing area provides an electrical path through the regions of the conductive organic material and the regions of the compositionally different conductive material, and wherein the sensing area is in direct contact with a vapor comprising an analyte to be detected [provides a first response when contacted with a first analyte, and a second different response when contacted with a second different analyte], wherein the compositionally different conductive material is selected from the group consisting of [an organic conductor, an organic complex,] an inorganic conductor, a carbon black, and a mixed inorganic/organic conductor, wherein the inorganic conductor is a metal, a metal alloy, a [highly] doped semi-conductor, [or] a superconductor, or a combination thereof and wherein the inorganic conductor has an electrical conductivity that decreases as the temperature increases; and

an apparatus in electrical communication with the conductive leads for detecting a change in the sensing area

between the at least two conductive leads when contacted with an analyte.

104. (Amended) A sensor, comprising:

at least two conductive leads;

a sensing area comprising alternating interpenetrating regions of a conductive organic material and a conductive material compositionally different than the conductive organic material disposed between and in electrical communication with the at least two conductive leads, wherein the sensing area provides an electrical path through the regions of the conductive organic material and the regions of the compositionally different conductive material, and wherein the sensing area is in direct contact with a vapor comprising an analyte to be detected [provides a first response when contacted with a first analyte, and a second different response when contacted with a second different analyte], wherein the compositionally different conductive material is selected from the group consisting of an organic conductor, an organic complex, an inorganic conductor and a mixed inorganic/organic conductor, wherein the inorganic conductor is a metal, a metal alloy, a [highly] doped semi-conductor, or a superconductor, or a combination thereof and wherein the inorganic conductor has an electrical conductivity that decreases as the temperature increases; and

an apparatus in electrical communication with the conductive leads for detecting a change in the sensing area between the at least two conductive leads when contacted with an analyte.

105. (Amended) A sensor, comprising:

at least two conductive leads;

a sensing area comprising dispersed regions of a conductive organic material and a conductive material compositionally different than the conductive organic material wherein the dispersed regions provide interpenetrating regions of the conductive organic material and a conductive material compositionally different than the conductive organic material, the sensing area disposed between and in electrical communication with the at least two conductive leads, wherein the sensing area provides an electrical path through the regions of the conductive organic material and the regions of the compositionally different conductive material, and wherein the sensing area is in direct contact with a vapor comprising an analyte to be detected [provides a first response when contacted with a first analyte, and a second different response when contacted with a second different analyte], wherein the compositionally different conductive material is selected from the group consisting of an organic conductor, an organic complex, an inorganic conductor and a mixed inorganic/organic conductor, wherein the inorganic conductor is a metal, a metal alloy, a [highly] doped semi-conductor, or a superconductor, or a combination thereof and wherein the inorganic conductor has an electrical conductivity that decreases as the temperature increases; and

an apparatus in electrical communication with the conductive leads for detecting a change in the sensing area between the at least two conductive leads when contacted with an analyte.

106. (Amended) A sensor, comprising:

at least two conductive leads;

a sensing area comprising alternating <u>interpenetrating</u> regions of a polyaniline or an emeraldine salt of polyaniline and a conductive material compositionally different than the polyaniline or emeraldine salt of polyaniline disposed between, and in electrical communication with, the at least two conductive leads, wherein the sensing area provides an electrical path through the <u>alternating interpenetrating</u> regions of polyaniline or emeraldine salt of polyaniline and the conductive material compositionally different than the polyaniline or emeraldine salt of polyaniline [and wherein the area provides a first response when contacted with a first analyte, and a second different response when contacted with a second different analyte]; and

an apparatus in electrical communication with the conductive leads for detecting a change in the sensing area between the at least two conductive leads when contacted with an analyte.

107. (Amended) The sensor of claim 106, wherein the conductive material compositionally different than the polyaniline or emeraldine salt of polyaniline is selected from the group consisting of an organic conductor, an organic complex, an inorganic conductor, and a mixed inorganic/organic conductor, wherein the inorganic conductor is a metal, a metal alloy, a [highly] doped semi-conductor, an oxidized metal, a superconductor, and any combination thereof.

108. (Amended) A sensor array comprising:

a plurality of sensors, wherein at least one sensor comprises:

at least two conductive leads;

a sensing area comprising alternating interpenetrating regions of a conductive organic material and a conductive material compositionally different than the conductive organic material disposed between and in electrical communication with the at least two conductive leads, wherein the sensing area provides an electrical path through the alternating interpenetrating regions of the conductive organic material and the regions of the compositionally different conductive material, [and wherein the sensing area provides a first response when contacted with a first analyte, and a second different response when contacted with a second different analyte] wherein the compositionally different conductive material is selected from the group consisting of an organic conductor, an organic complex, an inorganic conductor and a mixed inorganic/organic conductor, wherein the inorganic conductor is a metal, a metal alloy, a doped semi-conductor, or a superconductor, or a combination thereof and wherein the inorganic conductor has an electrical conductivity that decreases as the temperature increases.

115. (Amended) The sensor array according to claim 108 or 113, further comprising an apparatus for detecting a change selected from the group consisting of resistance, conductance, impedance, and capacitance in the electrical properties of at least one sensor [wherein the first and/or second response is a change in an electrical impedance].

117. (Amended) The sensor array according to claim 110, wherein the inorganic conductor is [a member] selected from the group consisting of Ag, Au, Cu, Pt, carbon black, and AuCu.

124. (Amended) The sensor array according to claim 108, wherein the alternating regions of the conductive organic material and the conductive material compositionally different than the conductive organic material are interpenetrating regions of conductive organic material and conductive material compositionally different than the conductive organic material.

126. (Amended) A sensor array comprising:

a plurality of sensors, wherein at least one sensor comprises:

at least two conductive leads;

a sensing area comprising alternating interpenetrating regions of a conductive organic material and a conductive material compositionally different than the conductive organic material disposed between, and in electrical communication with, the at least two conductive leads, wherein the sensing area provides an electrical path through the regions of the conductive organic material and the regions of the compositionally different conductive material, wherein the compositionally different conductive material is selected from the group consisting of an organic conductor, an organic complex, and inorganic conductor, and a mixed inorganic/organic conductor, wherein the inorganic conductor is a metal having electrical conductivity that decreases as the temperature increases, a metal alloy, a [highly] doped semi-conductor, or a superconductor, or a combination thereof[, the sensor

constructed to provide a first response when contacted with a first chemical analyte, and a second different response when contacted with a second different chemical analyte]; and

a measuring apparatus electrically coupled to the at least two conductive leads for detecting a change in the sensing area when contacted with an analyte.

128. (Amended) A sensor array system comprising:

a plurality of sensors, wherein at least one sensor comprises:

at least two conductive leads;

a sensing area comprising alternating interpenetrating regions of a conductive organic material and a conductive material compositionally different than the conductive organic material disposed between and in electrical communication with the at least two conductive leads, wherein the sensing area provides an electrical path through the regions of the conductive organic material and the regions of the compositionally different conductive material, [and wherein the sensing area provides a first response when contacted with a first analyte, and a second different response when contacted with a second different analyte,] wherein the compositionally different conductive material is selected from the group consisting of an organic conductor, an organic complex, an inorganic conductor and a mixed inorganic/organic conductor, wherein the inorganic conductor is a metal, a metal alloy, a doped semi-conductor, or a superconductor, or a combination thereof and wherein the inorganic conductor has an electrical conductivity that decreases as the temperature increases;

a measuring apparatus that detects a change in the electrical properties of the at least one sensor, wherein the at least one sensor is in communication with the measuring apparatus; and

a computer comprising a resident algorithm, wherein the computer processes the change in the electrical properties [difference between the first response and the second response].

134. (Amended) The sensor array system according to claim 128, wherein the [first and/or second response is a] change in electrical properties is selected from the group consisting of impedance, conductance, capacitance, inductance, and resistance in the sensors.

137. (Amended) The sensor array system according to claim 128 or 135, wherein the [first and/or second response is a] change in electrical properties is a change in an electrical impedance.

142. (Amended) The sensor array system according to claim 128, wherein the conductive material compositionally different than the conductive organic material is [a member] selected from the group consisting of an organic conductor, an inorganic conductor, and a mixed inorganic-organic conductor.

143. (Amended) The sensor array system according to claim 128, wherein the conductive material compositionally different than the conductive organic material is [a member] selected from the group consisting of a metal, a metal alloy, a metal oxide,

an organic complex, a semiconductor, a superconductor, and a mixed inorganic-organic complex.

152. (Amended) A system for detecting an analyte in a sample, comprising:

a substrate having a plurality of sensors wherein at least one sensor comprises:

at least two conductive leads;

a sensing area comprising alternating interpenetrating regions of a conductive organic material and a conductive material compositionally different than the conductive organic material disposed between, and in electrical communication with, the at least two conductive leads, wherein the sensing area provides an electrical path through the regions of the conductive organic material and the regions of the compositionally different conductive material such that the at least one sensor provides a response that varies according to the presence of an analyte in contact with it, wherein the compositionally different conductive material is selected from the group consisting of an organic conductor, an organic complex, an inorganic conductor and a mixed inorganic/organic conductor, wherein the inorganic conductor is a metal, a metal alloy, a doped semi-conductor, or a superconductor, or a combination thereof and wherein the inorganic conductor has an electrical conductivity that decreases as the temperature increases;

a detector operatively associated with the plurality of sensors, for measuring the response of the plurality of sensors when contacted with the sample;

a sample delivery unit for delivering the sample to be tested to the plurality of sensors; and

an information storage and processing device configured to store an ideal response for a predetermined analyte and to compare the response of the plurality of sensors with the stored ideal response, to detect the presence of the analyte in the sample.

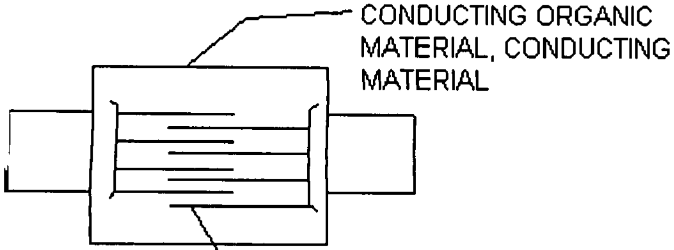


FIG. 1A-1

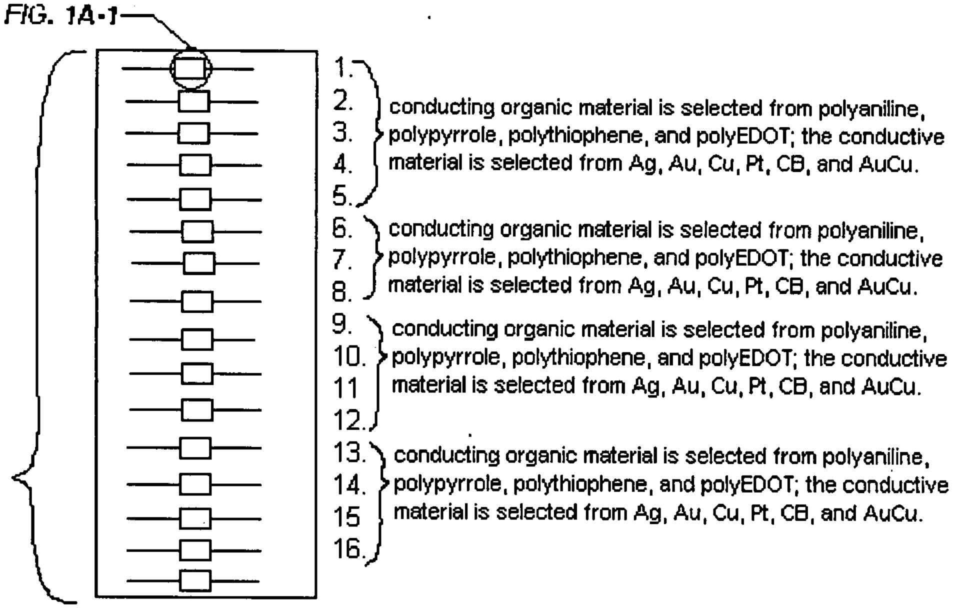


FIG. 1A

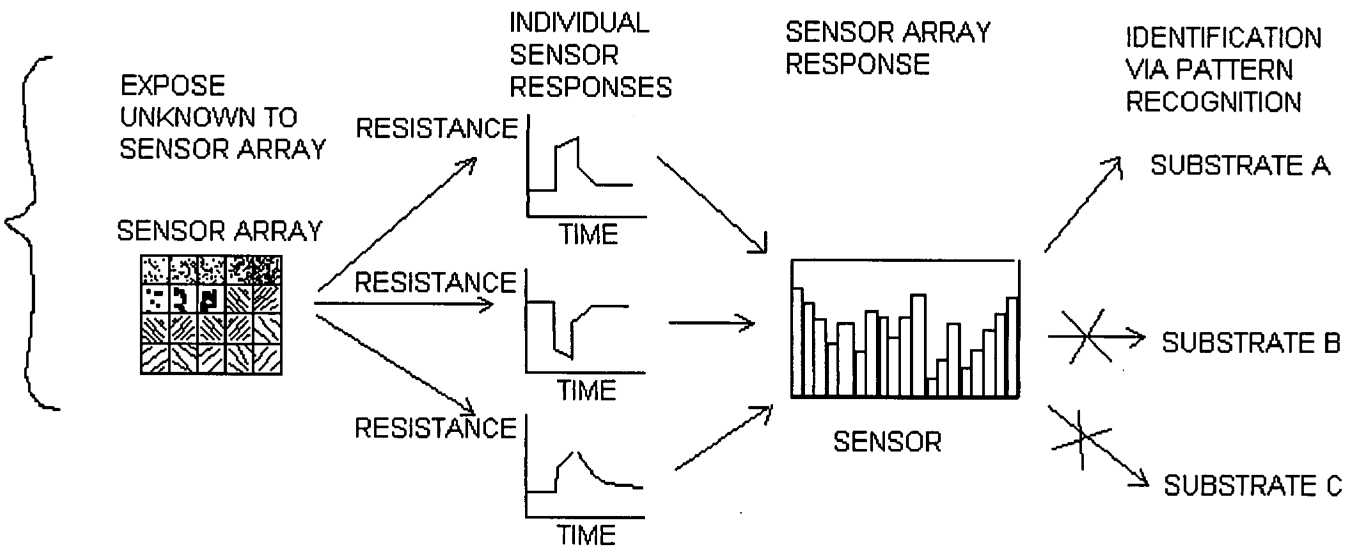


FIG. 1B

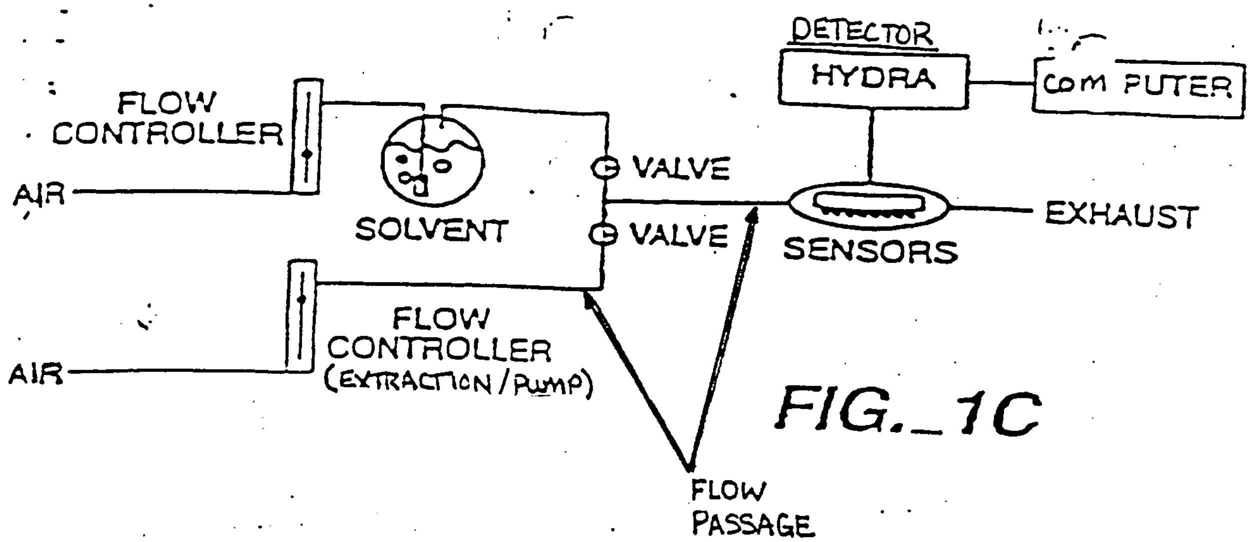
DETECTOR
HYDRA
COMPUTER
FLOW
CONTROLLER
AIR
SOLVENT
VALVE
VALVE
SENSORS
EXHAUST
FLOW
CONTROLLER
(EXTRACTION/PUMP)
AIR
FLOW
PASSAGE

FIG._1C

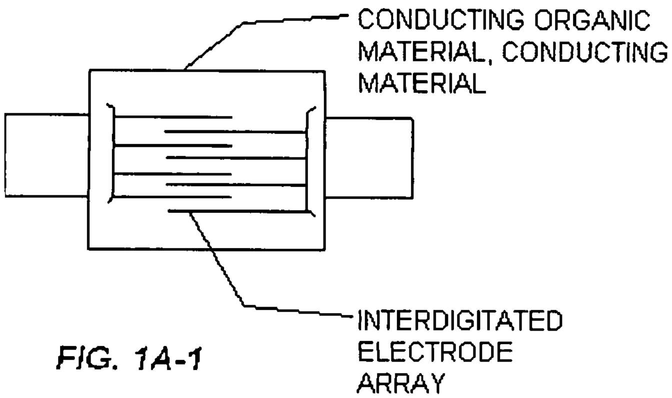


FIG. 1A-1

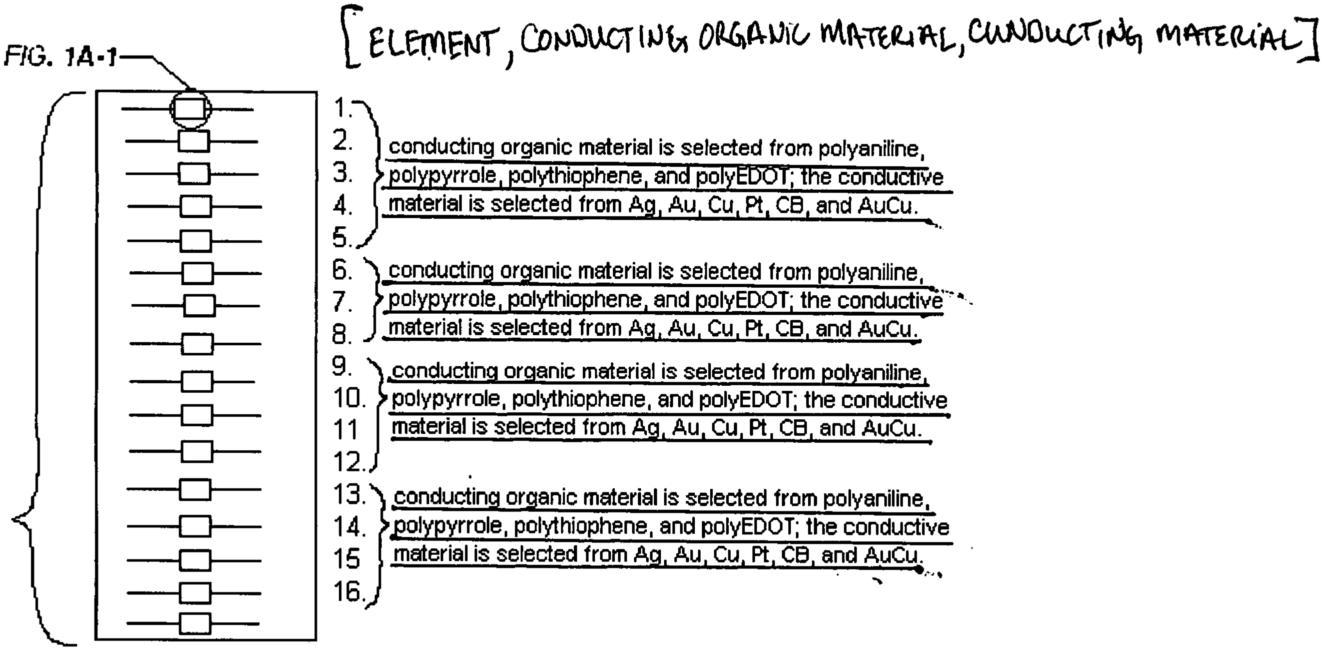


FIG. 1A

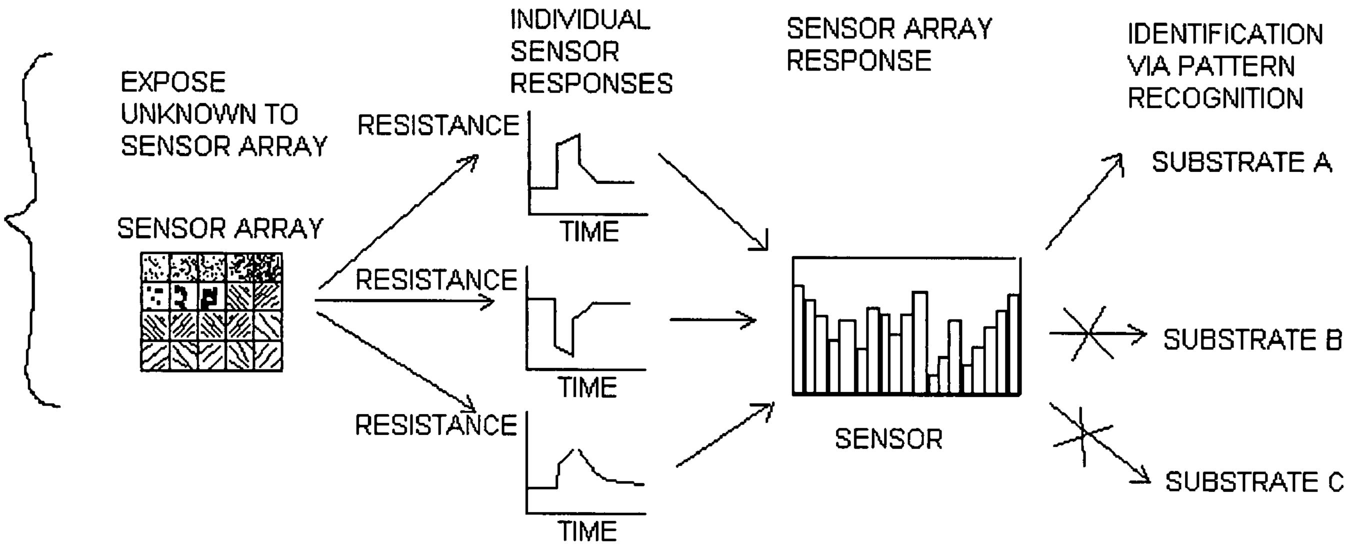


FIG. 1B



approved
AS 10/9/02

OK approved 10/9/02

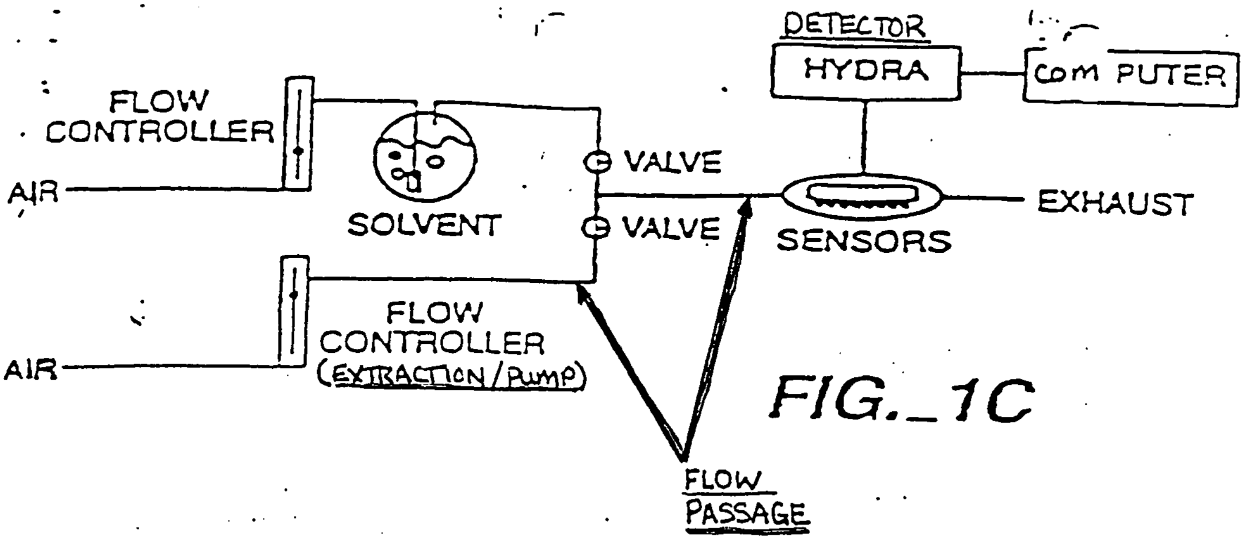


FIG._1C